Cassias commonly occurring or Cultivated in India

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(*With 38 figures in two plates*)

INTRODUCTION

The genus *Cassia* is known for its ornamental, economic and medicinal value. There are 500-600 spp. of *Cassia* occurring in the tropical and warm temperate regions of the world (Willis 1966). They are trees, shrubs or herbs. Bentham (1869) has given a comprehensive account of the genus containing 338 species. In India, Hooker *et al.* (1879) have reported 18 spp. of *Cassia*. Taxonomic description of spp. is given in regional floras by Duthie (1903), Cook (1903), Haines (1922), Gamble (1915), Maheshwari (1963) and others. Ornamental species by Blatter *et al.* (1937), Randhawa (1965) and others. Economical and medicinal species by Watts (1889), Gamble (1902) and Chopra *et al.* (1956).

An artificial key based on broad morphological characters has been prepared and a description of the important species commonly found wild or cultivated in India is presented along with few illustrations.

ARTIFICIAL KEY TO THE SPECIES OF *Cassia* LINN.

A. **Trees:**
- B. Pod dehiscent .. .. *C. siamea*
- BB. Pod indehiscent
  - C. Fls. in lax pendulous racemes, very large *C. fistula*
  - CC. Fls. in corymbose racemes:
  - D. Bract at the base of flower stalk absent. Young leaflets finely hairy and with coppery tinge. Fls. rose coloured .. *C. grandis*
  - DD. Bracts conspicuous at the base of flower stalk, persisting till the fls. open:
    - E. Fls. yellow .. .. *C. multijuga*
    - EE. Fls. not yellow:
    - F. Fls. pink:
    - G. Leaflets 6-14 pairs:
    - H. Leaflets pointed at the apex, smooth .. .. *C. nodosa*

HH. Leaflets rounded at the apex, hairy below .. .. .. *C. javanica*
GG. Leaflets 8-20 pairs .. .. *C. renigera*
FF. Fls. terracotta-red .. .. *C. roxburghii*

AA. **Shrubs, undershrubs or herbs** (*C. glauca* sometimes a small tree):
B. Sepals spathulate obtuse; rachis without glands *C. alata*
BB. Sepals broad, obtuse:
C. Rachis without glands between the leaflets:
D. Leaflets lanceolate, acute; pods slightly curved, not crested .. .. .. *C. angustifolia*
DD. Leaflets oblong, obtuse; pods much curved, crested on the valves opposite the seeds .. .. *C. obtusa*
CC. Rachis usually with several glands between the leaflets:
D. Large shrubs; stipules falcate, narrowly lanceolate, caducous .. .. .. *C. glauca*
DD. Large shrubs; stipules large, semicordate, persistent .. .. *C. auriculata*
DDD. Herbs or undershrubs; leaflets 3 pairs; glands 1-2 only .. .. *C. tora*
CCC. Rachis with a single gland at the base:
D. Leaflets 3-5 pairs, more or less ovate.. *C. occidentalis*
DD. Leaflets 4-8 pairs, not at all ovate .. *C. sophera*

BBB. Sepals narrow, acute:
C. Leaflets moderate sized, 2 pairs .. .. .. *C. absus*
CC. Leaflets small and many:
D. Petiole with a small sessile gland.. .. *C. mimosoides*
DD. Petiole with a long stipitate gland .. *C. pumila*

DESCRIPTION OF SPECIES

Cassia siamea Lamk. (Figs. 1-9) A medium-sized to large tree. Bark grey. Leaflets 6-12, oblong. Flowers in corymbose racemes clustered at the end of branches, yellow. Pods slightly curved at the posterior end, flat, dehiscent, 20-35 cm. long, 1-3 cm. broad with thickened sutures. Fls. April-July and October-December. Country of origin: Ceylon and Siam.

The wood of the plant is hard and highly valued, though seldom obtained in large size. Walking sticks and mallets are made from the wood.

Pods and leaves are used in medicine.

Cultivated. Plants can be raised through seeds sown a couple of months before the rains and seedlings transplanted in pits when they are 3 to 4 months old during rains.

Cassia fistula L. Popularly known as the Indian Laburnum and in vernacular as *Amaltas*. A medium-sized tree frequently planted in garden compounds and road sides. The tree is a mass of bright yellow flowers in summer. It has thick greenish grey bark; leaflets large, 4-8 pairs, glabrous, ovate, 8-16 × 6 cm. Bright yellow flowers occur in long, drooping racemes. Pods cylindrical, dark brown or black when ripe, 25-65 cm. long, 2-3 cm. in diameter, with many transverse septa. The flat seeds are embedded in sweetish pulp. Fls. April-July. Country of origin: India.

The wood of the plant is very durable, it makes excellent posts and is good for carts and other agricultural implements. The plant also yields valuable tanning material. The stem exudes gum used in industry.

Root bark, leaves and seeds are used as laxative. Fruit applied in rheumatic pain and snake bite. Leaves and fruit pulp contain anthraquinone derivatives.

Wild as well as cultivated. The plants are raised through seeds sown in March-April. Transplanting can be done in rains when plants are 3-4 months old.

Cassia grandis L. A medium-sized tree, popularly known as Horse Cassia. It has deep green foliage. The terminal leaflets have distinctive coppery tinge. Leaflets hairy to touch, 10-20 pairs, oblong, abruptly rounded at both ends. Flowers in axil of leaves in corymbose racemes, rose coloured. Pods 7.5-10 cm. in length, compressed, smooth, cylindrical and transversely wrinkled. Fls. February-April. Country of origin: Tropical America.

Wood is used for making small agricultural implements. Bitter fruit pulp is used as a purgative.

Cultivated. Plants can be raised through seeds.

Cassia multijuga Richard. A medium-sized tree. Leaflets 20-25 pairs, oblong, elliptic. Flowers bright yellow. Fls. February-September. Country of origin: South America.

Leaves are known to be used as substitute for senna.

Cultivated. Plants can be raised through seeds.

Cassia nodosa Buch.-Ham. A medium-sized evergreen tree. Bark reddish brown or ash coloured. Leaflets 6-14 pairs, oblong, pointed at the apex, smooth. Flowers in racemes, showy, pink, fading to dull white. Pods cylindrical, 30-45 cm. long. Fls. May-June. Country of origin: Burma, India and Malaya.

Cultivated. Plants can be raised through seeds.

Cassia javanica L. A medium-sized tree, popularly known as Java Cassia. Leaflets 6-14 pairs, 2.5-5 cm. long, 1-2.5 cm. broad, short stalked, oblong, ovate, rounded at the tips, hairy below. Flowers pink, fading to white. Sepals red. Stamens 10, three with swelling. Fls. May-July. Country of origin: Java.

Cultivated. Plants can be raised through seeds. It is reported that H. V. Kemball introduced the plants in Bombay around 1910.

Cassia renigera Wall. A medium-sized tree, popularly known as Burmese Pink Cassia. Leaflets 8-20 pairs, pointed at the apex, glossy and kidney-shaped, deciduous; stipules present at the leaf base. Flowers large, pinkish fading to rose white, borne on racemes in leafless branches. Sepals red. Pods smooth, 30-60 cm. long, similar to those of Indian Laburnum. Fls. April-June. Country of origin: Burma.

Wood is very hard and well suited for wheel making and handles for tools.

Cultivated. Plants can be raised through seeds. In Bombay the plant is reported to have been introduced by R. A. Forbes Sempill around 1902.

Cassia roxburghii DC. (Syn. *Cassia marginata* Roxb.). A small tree, popularly known as the Red Cassia. Leaflets 10-20 pairs, leathery above and blunt at the tips. Flowers in small clusters growing from axil of leaves on young twigs. Petals terracotta-red with fine green veins. All stamens bear anthers. The uppermost are the longest, and have no swelling in the middle. Base of flower stalk contains pale green bracts. Pods cylindrical, 20-30 cm. long, with transverse partitions. Fls. May-June. Country of origin: Ceylon and India.

Heartwood is light brown and very hard. The wood is well adapted for turning naves of wheels and handles of tools are made of it.

Cultivated. Can be raised through seeds. It is reported the plant was introduced into Calcutta in 1802. H. P. Dimmock originally planted them in Bombay.

Cassia alata L. Known in vernacular as *Dadmurdan.* A medium-sized shrub, with very thick finely downy branches, mostly cultivated, though uncommonly found wild. Rachis without glands. Leaflets oblong, large. Flowers large, yellow. Sepals spathulate, obtuse. Pods 10-20 cm. long furnished with a wing down the middle of each valve. Seeds 50 or more. Fls. October-December. Country of origin: West Indies.

Leaves are used in ringworm and snake bite. Decoction of leaves and flowers used internally in bronchitis, asthma and for washing eczematous patches. The plant is poisonous to livestock and fish. Plants contain chrysophanic acid.

Mostly cultivated. The plant is uncommonly found wild as a weed in neglected fields and open scrub jungle; it can be raised through seeds.

Cassia angustifolia Vahl. Popularly known as Tennevelly Senna and in vernacular as *Hindisana.* Shrub with leaflets 5-8 pairs, narrow, lanceolate, acute tapering from the middle towards the apex, glabrous or furnished with a scant pubescence. Racemes long with large yellow flowers. Sepals broad and obtuse. Pods flat 3.8-6.3 cm. long, 1.5-1.7 cm. broad, slightly curved. Seeds 6-12. Fls. November-March. Country of origin: Somaliland and Arabia.

The leaves of the plant yield "Senna Drug". Leaves and fruits are used as laxative, and purgative. The leaves contain Kampferin, anthraquinone, chrysophanic acid, isorhamnetin and calcium oxalate.

Cultivated usually on dry lands, sowing is either by broadcasting or dribbling. The seeds have a tough seed coat and a certain amount of abrading the surface is necessary to induce even and quick germination. Plants require bright sunshine and occasional drizzling. When leaves are fully grown, thick and bluish in colour, they are stripped off by hand. A second stripping is done after about a month and the plants allowed to bear flowers to set seeds. The wet land crop is also very successful under controlled conditions. (WEALTH OF INDIA 1950.)

Cassia obtusa Roxb. (Syn. *C. obovata* L.). A diffuse herb found as weed. Leaflets oblong, obtuse. Flowers pale yellow in narrow few flowered racemes. Sepals broad, obtuse. Pods much curved, crested on the valves opposite the seeds, flexible, glabrous. Seeds 6-12 obovate, cuneate, separated by the partition, funicles long. Fls. July-October.

Leaves are given in stomach ailments like indigestion and irritation. Leaves and pods contain oxymethyl-anthraquinone.

The plants are found wild along road sides, and on fallow land, etc. They can be raised through seeds.

Cassia glauca Lamk. (Figs. 10-17.) A large shrub (at times a small tree). Rachis usually with several glands between the leaflets. Stipules falcate, narrowly lanceolate, caducous. Leaflets ovate, acute. Flowers in axillary corymbose racemes. Anthers 10, all perfect and subequal. Pods 10-20 cm. long, flat, with 20-30 seeds. Seeds small, smooth, dark brown attached with filiform funicles. Fls. February-July. Country of origin: India.

Bark and leaves are used in diabetes and gonorrhoea.

Wild as well as cultivated. Seeds are sown two months before rains and seedlings transplanted during the rainy season.

Cassia auriculata L. Known in vernacular as *Tarwar* or *Avaram*. A shrub or undershrub, cultivated but often found wild, with finely downy branches. Leaflets nearly sessile; rachis grooved, pubescent, furnished with a single linear gland between the leaflets of each pair. Stipules large, leafy, semicordate, persistent. Leaflets 8-12 pairs, 1.3-2.5 cm. long, obovate, oblong, obtuse or emarginate. Flowers in corymbose racemes, bright yellow. Pods 10-12.5 cm. long, slightly curved, obtuse, glabrous. Seeds 10-12. Fls. October-January.

The plant yields valuable tanning material used in leather industry; it is suitable for clothing barren tracts and as green manure crop. Leaves are eaten as green vegetable in time of famine. Branches used as tooth sticks.

Almost all parts of plant except flowers are used in the cure of skin diseases, anthelmintic, ophthalmia and conjunctivitis, in diabetes and chylous urine.

The plant is commonly found as a weed in barren tracts and scrub jungle. It can be raised through seeds. The twig bark is stripped off and dried in small cornets. Plants grown on lime rich soils are richer than those grown on red loam and gravelly soils. (WEALTH OF INDIA 1950).

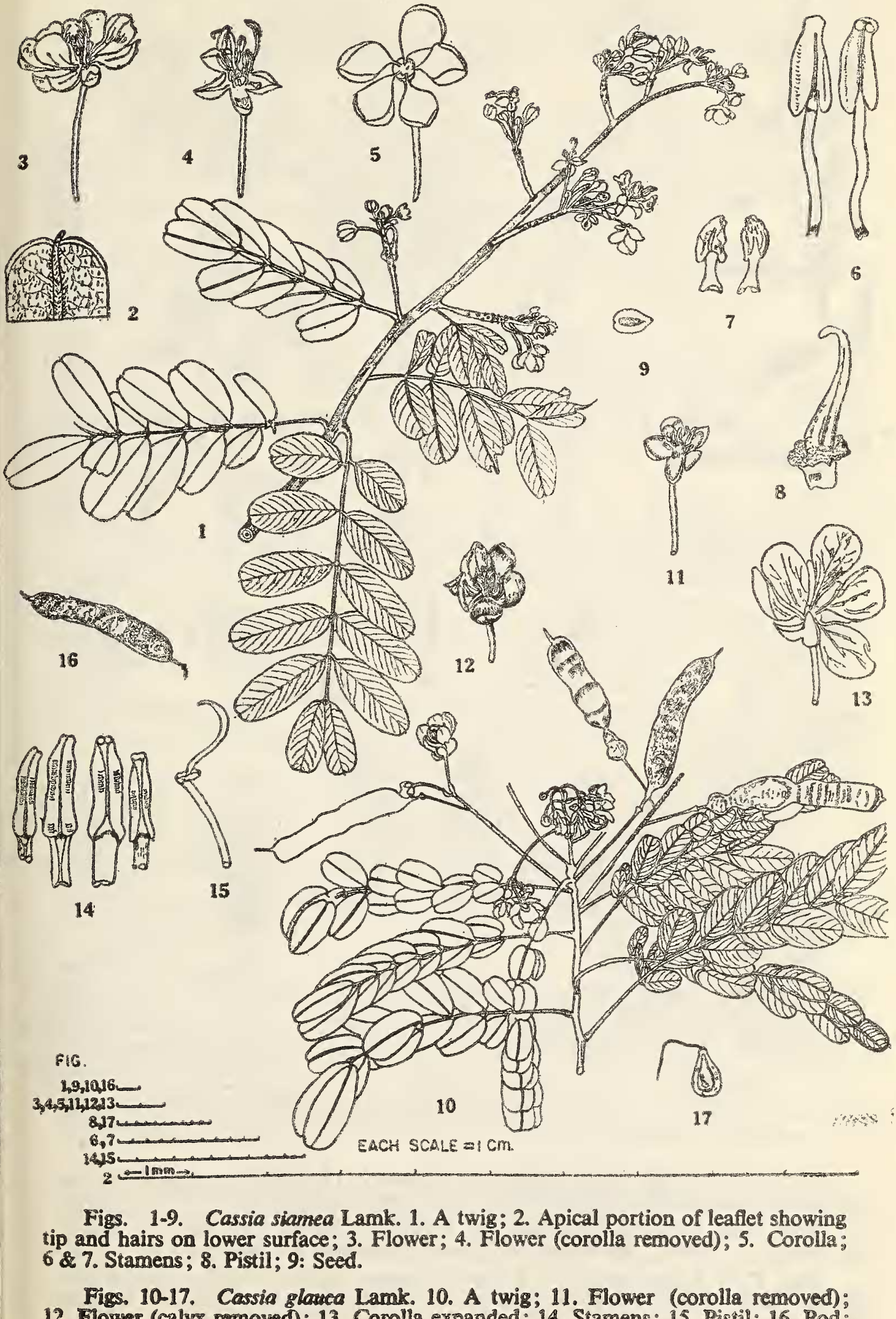
Cassia tora L. (Figs. 32-38.) Known in vernacular as *Chakramarda*, *Dadmari* or *Chakunda*. A herb or under-shrub. Leaflets 3 pairs, 3-5 cm. long, 1.5-2.5 cm. broad, obovate, oblong, with a gland between the lowest pair. Flowers bright yellow, fertile stamens 7, the upper reduced to staminodes. Pods 15-25 cm. long, 4-6 mm. broad, stout, obliquely septate. Fls. August-October. Country of origin: Tropical America.

Leaves are used as laxative. Leaves and seeds are also used in skin diseases like ringworm and itch. Roots used in snake bite. Plant contains emodin, glucosides and an unpleasant smelling fixed oil.

The plants are found as weeds everywhere; can be raised through seeds.

Cassia occidentalis L. (Figs. 26-31.) Known in vernacular as *Kasondi*. A diffuse undershrub found as weed, 60-150 cm. tall. Leaves with an

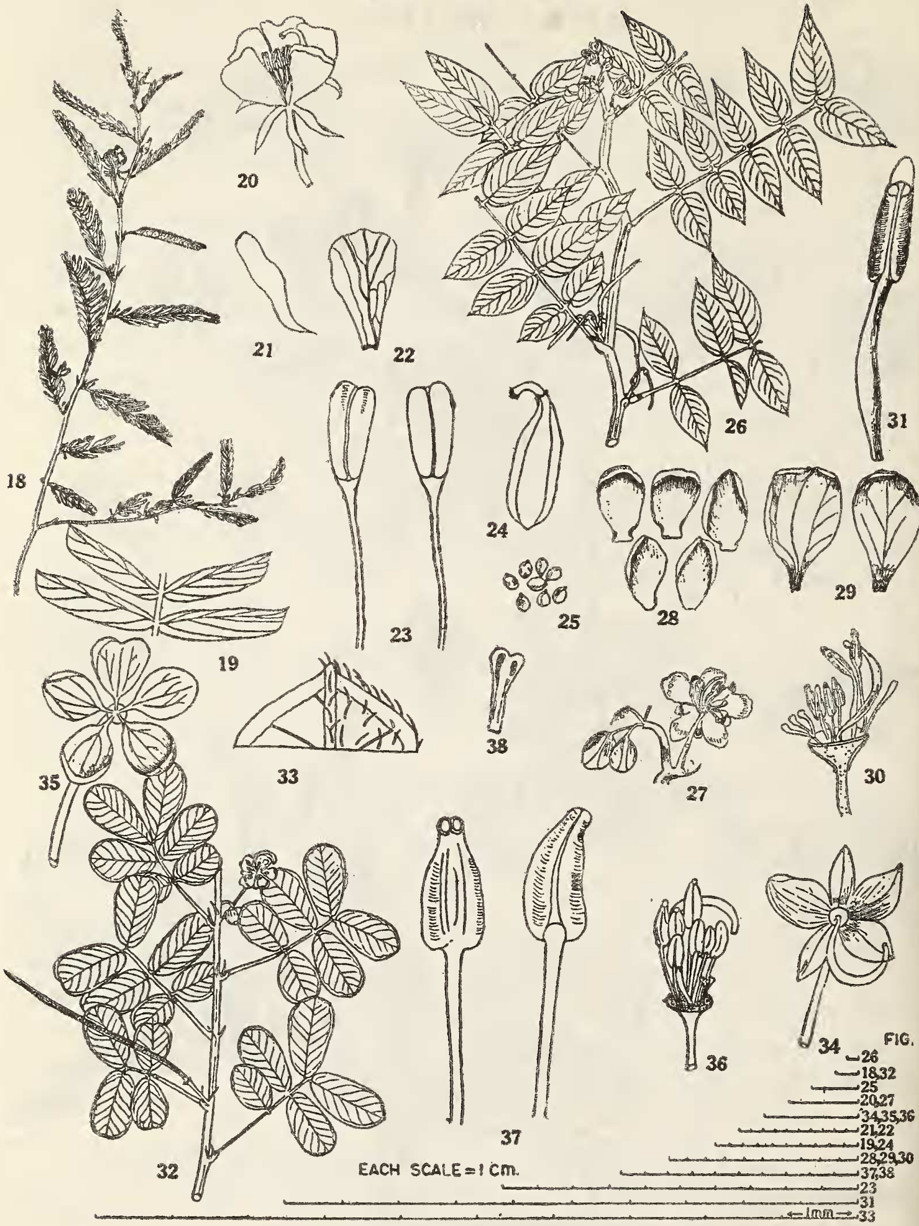
PLATE -1. FIG. 1-17.



Figs. 1-9. *Cassia siamea* Lamk. 1. A twig; 2. Apical portion of leaflet showing tip and hairs on lower surface; 3. Flower; 4. Flower (corolla removed); 5. Corolla; 6 & 7. Stamens; 8. Pistil; 9: Seed.

Figs. 10-17. *Cassia glauca* Lamk. 10. A twig; 11. Flower (corolla removed); 12. Flower (calyx removed); 13. Corolla expanded; 14. Stamens; 15. Pistil; 16. Pod; 17. Seed with funicle attached.

PLATE-2. FIG. 18-38.



Figs. 18-25. *Cassia pumila* Lamk. 18. A branch; 19. A portion of leaf showing two pairs of leaflets; 20. Flower; 21. Sepal; 22. Petal; 23. Stamens; 24. Pistil; 25. Seeds.

Figs. 26-31. *Cassia occidentalis* L. 26. A twig; 27. Flower with buds; 28. Sepals; 29. Petals; 30. Flower androecium and gynoecium shown; 31. Stamen.

Figs. 32-38. *Cassia tora* L. 32. A twig; 33. Apical portion of leaflet showing hairs on the lower surface; 34. Flower (corolla and androecium removed); 35. Corolla; 36. Flower (calyx and corolla removed); 37. Stamens; 38. Staminode.